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NEWSLETTER

National Clonal Germplasm Repository
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Kim E. Hummer, Research Leader/Curator

June 1989

New Accessions

These past several months have been quite busy. Since January 1989 we have received 417 new accessions from all around the world. Working closely with Dr. Shawn Mehlenbacher at Oregon State University, we obtained 90 new *Corylus* from cooperators in Europe and China. We have germinated seed of *Corylus corluma* v. *lacera* (*C. jacquemontii*) from Pakistan and *C. heterophylla* and *C. chinensis* from China. Upon release from post entry quarantine the European cultivars will be available for the OSU *Corylus* breeding program and other requesters.

We received 92 new *Pyrus* including a *P. mamorensis* seed lot from Morocco, *P. pashia* from Pakistan, four of Laxton's selections from England, and 21 cultivars, selections, and rootstocks from Saanichton, BC, Canada. Dr. Mel Westwood's *Pyrus* legacy continues and we obtained 45 additional species selections from his old collection.

About 60 new *Rubus* accessions were obtained from Pakistan, Washington State University, Oregon State University, Ecuador, and Germany. These species include *R. anatolicus, R. macilentus, R. niveus, R. hoffmeisterianus*, and *R. irritans*.

Working with American and Canadian quarantine officials we finally obtained 22 black currants from the Canadian collection in Vineland, Ontario, some of which came from Poland and Russia in previous years. Dr. J. Recken also graciously sent us 10 gooseberry and currant selections from East Germany. These plants will remain in post-entry quarantine for two years.

Dr. Maxine Thompson brought us several new *Fragaria* species from Pakistan, *F. nubicola* and a unique clone from Naltor and we received several species (*F. orientalis, F. inumae, F. viridis, F. nipponica*) from the Soviet Union, delivered to us by Dr. Gene Galletta.

For *Vaccinium* we collected 7 cranberry cultivars from Bandon, Oregon and we received a seedlot of *V. floribundum* from Ecuador donated by Mr. Dixon. We have also germinated cranberry seed that Dr. Calvin Sperling donated to us last fall.

One exciting new set of additions to our collection was *Sorbus* originally from the I.V. Michuran Central Laboratory of Genetics in the Soviet Union. The Hortus Botanikos Kaunensos in Lithuania sent these *Sorbus* to Mr. Thomas Plocher of White Bear Lake, MN who forwarded them to us. These old *Sorbus* cultivars and species selections have not been available before in the United States. Our Seattle APHIS inspector, Mr. Mitch Nelson, observed a fungus (*Seimatosporium sp.*) on this material. He allowed us to keep this material, however, as long as we treated with fungicide and maintain it under watchful eyes in our isolation greenhouses. We appreciate APHIS cooperation and assistance on this and on all our germplasm importation. Maxine Thompson also brought us some *Sorbus, Sambucus, Cotoneaster*, and *Crataegus* from Pakistan. We received 6 edible quince cultivars alive from Brogdale and 2 from Saanichton.

Our friend, Mr. Hill Craddock, in Torino, Italy working with Dr. Romisondo and others at the Instituto di Frutticoltura Industriale, sent us several scions of *Mespilus Crataegus* and *Cydonia*.* We look forward to obtaining additional *Mespilis* clones so that we can generate viable seed. (We have several clones now).

We look forward to receiving native small fruit seedlots from Dr. Luby who will be collecting for us in the Northern Rocky Mountains this summer. We also hope to expand the *Vaccinium* collection from the New Jersey Research Station and native collections throughout the East.

Several proposals to collect small fruit in Ecuador and Chile are in the offing for 1990, pending exploration funding approvals.

Staffing Changes

Dr. Mel Couey, Research Leader at NCGR, retired in January, 1989. He had worked with the USDA/ARS for more than 32 years. He was stationed at Fresno, CA, Wenatchee, WA, Hilo, HI, and most recently at our facility in Corvallis. He continues to work as an Associate Editor for ASHS and is managing a peach orchard and small fruits business in Albany, Oregon.

Dr. Kim Hummer was appointed as Research Leader/Curator upon Dr. Couey's retirement.

In February, 1989, Dr. Barbara Reed was appointed as Horticulturist/Plant Physiologist to conduct research on cryopreservation and in vitro culture storage of temperate fruit and nut germplasm. She received her Ph.D. from Oklahoma State University in 1977 and worked most recently here at the repository in a post-doctoral research position. We are happy to have her continue with the work she started as a post-doc.

Ms. Carolyn Paynter has assumed the responsibilities of Biological Technician working with Dr. Reed in the laboratory. Carolyn was schooled at the University of Oregon, Southern Oregon State College, and Oregon State University. She most recently worked in the Department of Botany and Plant Pathology at Oregon State University. Carolyn will assist in providing our increasingly numerous in vitro plant requests.

Mr. Bill Doerner has been hired to fill a new position of Agricultural Technician in Integrated Pest Management. We have needed an entomological perspective at the repository and Bill will address this need. Bill was working on a five year USDA-ARS program of grasshopper management in Idaho but we convinced him to move to rainy Oregon. Bill has already initiated an IPM program involving release of predatory insects, monitoring insect populations, and applications of pesticides as needed.

Our Greenhouse Manager, Patricia Robbins, resigned in the middle of March, 1989. She had worked at the repository since 1981, assisting in the greenhouses and screenhouses with propagation, maintenance of

*and *Sorbus* (which did not survive).

Duplicate clones may be requested from different sources to insure that correct identities are obtained. Everything and anything with that genus name is accepted to build up inventory.

Soon available resources are stretched and a second phase begins. Plants are large enough for evaluations, and research of information on the plants is expanded. Identities are confirmed. Certain species are vastly over represented, i.e. genes are duplicated, while others are missing entirely. New accessions are acquired at about the same rate as incorrect or duplicate germplasm is eliminated. The total inventory of plants remains level. This is a justified and needed phase. A steady inventory does not imply that germplasm priorities are not being carried out. Certain members of the germplasm community look to repositories to store every plant in existence and continue to increase their collections at a steady rate over time. This is not possible with finite resources.

Repository curators and Crop Advisory Committees should have a slightly different viewpoint on germplasm acquisition and maintenance than do breeders. Breeders, quite justifiably, work closely with their material and develop ideas of what is "definitely" useful (good) and what is not. A curator should represent world germplasm with the "good" and the "bad" genes in each genus. A curator, however, cannot develop the attachment to every breeding line that a breeder must have.

Curators sometimes may disappoint breeders in choosing not to maintain every breeding line donated, but this does not diminish the importance of the donated clones that are maintained. Elimination of duplicate and certain incorrectly identified germplasm is a vital activity that must be directly addressed by each curator and CAC at a germplasm repository.

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the collections, and plant requests. We appreciate the effort she gave to the repository and wish her the best in the coming years.

Her position is under recruitment. We hope to select a permanent replacement by the end of the summer.

NCGR Staff

Dr. Kim Hummer, Research Leader/Curator
Dr. Francis Lawrence, Small Fruits
Dr. Barbara Reed, Cryopreservation
Dr. Henrietta Chambers, *Mentha*
Jim Chandler, Biological Technician
Bill Doerner, Integrated Pest Management
Donna Gerten, Information Manager
Mickey Hooton, Secretary
Carolyn Paynter, In Vitro
Joseph Postman, Plant Pathologist
Joe Snead, Field Manager
Dr. Norman James, NPGS- Special Assignment
Dr. Mel Couey, Collaborator
Dr. Harry Lagerstedt, Collaborator
Dr. Mel Westwood, Collaborator

Germplasm Status in Economically Important Crop Species.

by Dr. Norman James

The ARS-National Program Staff, is conducting a survey of State, Federal, and private breeding and genetic programs. The purpose of the survey is to determine the commodities that are being improved, the amount of effort on each commodity and the likelihood of the program continuing when the incumbent breeder/geneticist retires or resigns. The survey also asks what will be done with the germplasm if the program is closed, and if the institution is willing to participate in a national activity to salvage at least the valuable germplasm when programs are closed. Data collected will show where significant amounts of improved germplasm are likely to be lost and how wide spread the problem continues to be.

The survey is about 50% completed Results show that improved germplasm and the working collections associated with improvement programs are generally considered the "property" of the breeder/geneticist and that there is no mechanism, plan, or effective institutional concern about this genetic material beyond what is distributed by the incumbent breeder/geneticist who developed the material. This often results in the loss of material that took 30 to 50 years to develop, except for a few of the best genotypes that are released. A national program is needed to help preserve germplasm when programs are closed and to assist in continuing programs when they are the last remaining program in a commodity.

Mentha Collection

by Henrietta Chambers

Dried vouchers and pickled buds of *Mentha* which student workers prepared in the summer of 1988 have been sorted and compared with published descriptions of the taxa, the notes, and the oil analysis data that accompanied the collection. The pickled buds were used to access male sterility or fertility and compared with the earlier observations of the mint breeder. The identity of questionable clones will be verified by Dr. Arthur O. Tucker when he visits the repository in July and the incorrect clones will be eliminated from the collection. Fortunately, most of the questionable accessions represent duplicate germplasm or F_1 and backcross hybrids for which we have both parents or one or more other clones of the same cross. The bulk of these questionable clones came to the repository in July 1983 from field plots where some clones had died and been replaced by aggressive neighboring clones or volunteer seedlings. Removing duplicates and incorrect material from the collection will allow room for the acquisition of new, well-documented germplasm.

Other ongoing projects include correspondence with taxonomists in the U.S., Europe, Asia, Australia, and New Zealand requesting seed or rhizomes of species that the collection lacks. We are making nomenclatural changes in the accessions list to reflect current preferred species designations and thus the 1990 list will be more valuable to *Mentha* researchers around the world.

Update on New *Corylus* Germplasm

by Joseph Postman

During 1987, 1988, and 1989, 135 new clonal *Corylus* accessions were received at the repository from several European and Asian countries in an effort to expand the genetic diversity of United States *Corylus* germplasm resources. Since apple mosaic virus (ApMV) has been previously detected in *Corylus* clones coming to the U.S. from Italy, Turkey, and Spain, all clonal accessions received at the repository are screened for this virus using the ELISA test. The total number of *Corylus* clones imported from each country and the number that have been detected with apple mosaic virus are listed in the table below:

Source Country	Clones Received	ApMV Infected
China	6	0
Denmark	5	0
France	9	0
Italy	29	4
Korea	16	0
Netherlands	4	0
Spain	25	14
United Kingdom	36	1
Yugoslavia	5	0

Successful Therapy of Virus Infected *Corylus* Clones

by Joseph Postman

Since 1986, 32 *Corylus* accessions in the NCGR collection have tested positive for apple mosaic virus. Recently, 13 infected clones were successfully propagated following heat-therapy. These clones are now established in our screenhouse and preliminary virus testing shows them to be free of ApMV. In addition, 5 heat-treated meristem derived clones are now growing in vitro. Following rooting or micrografting, these 5 will be established in the greenhouse and retested for ApMV this summer. Virus elimination is considered successful after heat-treated plants undergo one natural dormant period and re-test virus-negative.

Field Plantings

by Joe Snead

The field plantings continue to change. We hope to acquire about forty additional acres within three miles of our present site. We are waiting for congressional approval on this request.

The severe February freeze allowed us to evaluate field plantings for cold hardiness. Our *Rubus* field is growing well (back from the roots). Many large plants were killed to the ground. Cold hardiness data was taken in the blackberries. The raspberries were young and small and were protected by snow. This spring many additional accessions were planted in the field, filling the space that was ready. The *Vaccinium* field is another planting where we had the opportunity to take cold hardiness data this year. This field has regrown nicely, however cold weather did substantially reduce the flower buds so fruit evaluations will not be

taken this year.

This summer we will set up a cranberry field collection near the repository buildings. We needed an electrical source to operate controls for a frost protection system and this area has an irrigation system already. This should be an attractive planting once established.

The *Ribes* field is now in its third leaf and is doing nicely. It will be in top shape for the *Rubus, Ribes* Symposium in June.

The *Pyrus* field is being reorganized. Some of the misidentified and duplicate accessions have been removed. Accessions which have gone through our virus elimination program are replacing the infected accessions in the field. Our Asian pears have been propagated and will be planted in one block. This will make observations and comparisons easier. Rootstocks will be planted on their own roots in a new block.

GRIN

by D.M. Gerten

Updating of the Germplasm Resources Information Network (GRIN) at NCGR-Corvallis is now on a quarterly schedule for inventory, accession, distribution, and cooperator records. dBase-to-GRIN transfer protocols have been developed to expedite data uploading to GRIN and are now in place.

Copies of programs and file structures are available to any interested sites. I will be glad to help set up protocols if desired.

We are looking forward to loading *Pyrus* observation data this summer following the update of *Pyrus* accession records. There will be quite a few records to load for the approximately 2,000 pear accessions. *Corylus* observation data will also be loaded this summer (several years worth of data).

The 1989 evaluation data for all crops will be loaded in the fall after this years field season data collection.

Germplasm Enhancement

by Dr. F.J. Lawrence

Nine thornless 6x blackberry selections were made in the cross of a 4x thornless red raspberry-blackberry hybrid and 8x Austin Thornless. These selections were made to expand the 6x thornless blackberry germplasm for developing more hardy thornless 6x types.

655 clones of strawberry were screened for resistance to a field composite of red stele, *Phytophthora fragariae*. This group consisted of 129 clones from the NCGR collection, 136 *F. chiloensis*, plus 52 selections from Washington State University, and 338 ORUS selections from the cooperative USDA-Oregon State program. Thirty-one clones were noted resistant and a number of clones were intermediate in resistance.

In Vitro

by B. Reed, C. Paynter, M. Norton

Cold storage collections were evaluated in December and May and repropagated as needed. All in vitro accessions are now labeled with bar codes and inventories and evaluation are loaded to a computer file. Storage of cultures in Star-pac^{tm} polypropylene bags for six months has been very successful. We are also using the bags for shipping as they eliminate the possibility of contamination.

In vitro collections of several genera have been expanded this spring. One hundred thirty three *Ribes* accessions were established in culture. They will be added to the cold storage collection. About 40 additional *Corylus* clones and 82 *Pyrus* accessions have also been recently established.

At the end of May the tissue culture/cryopreservation activities moved into the newly remodeled laboratory in the room next door. The former location is now set up for multipurpose laboratory use by other staff members and visiting scientists.

Computer files have been established for all in vitro and cold stored accessions. Information on growth habit, growth media, storage data, and requests is now readily available.

Cryopreservation

by Barbara Reed

Methods developed for cryopreservation of *Rubus* and *Pyrus* are being used to screen the collections. Those species and cultivars which have high survival rates will be stored in liquid nitrogen.

Strawberry accessions retrieved from cryopreservation are being evaluated in the field this season and selected vials from long term storage have been thawed and are being regrown for evaluation next year.

Pollen of 16 *Pyrus* accessions was collected in April and sent to NSSL at Fort Collins for cryopreservation studies in progress there.

In Vitro Virus Therapy

by Joseph Postman

New tissue culture growth chambers with atmospheric CO_2 control have been set up in our in vitro laboratory. Initial trials are underway to develop a reliable method for heat treating virus infected accessions that are already growing in vitro. Elevated CO_2 optimizes growing conditions and has been reported to enable plants that are sensitive to high temperatures to survive heat therapy. New tissue culture containers, heat sealable polypropylene bags with high gas exchange, should permit us to receive the optimum benefit from CO_2 enrichment in the in vitro environment. In vitro thermotherapy will provide a very useful tool for streamlining our virus elimination protocol, and will also provide a consistent, uniform environment for studying the process of virus elimination.

Inventory of Commercial Sources of Fruits, Berries, and Nuts

by Joseph Postman

The Seed Savers Exchange, a non-profit organization dedicated to the preservation of historic, heirloom vegetable and fruit varieties, has compiled an inventory of fruit, berry, and nut varieties that are available from commercial sources in the United States. NCGR-Corvallis assisted Seed Savers in preparing this book by providing nursery catalog directories and by loaning catalogs from our nursery catalog library. This book contains descriptions of over 4,000 varieties, and will help both amateur and professional workers in the germplasm community locate commercial sources for unusual or hard-to-find varieties. More information about this "catalog of catalogs" can be obtained by contacting Seed Savers Exchange, RR3, Box 239, Decorah, Iowa, 52101.

Curators Corner

by Kim Hummer

Periodically, the germplasm system, and our clonal repository in particular, have come under criticism for eliminating germplasm which was labeled incorrectly or determined to be duplicates. I wish to address this issue.

The lifespan of a clonal germplasm repository involves several phases. The first period after establishment involves a major collection effort to amass representatives of assigned genera. New accessions increase in a logarithmic fashion as the curator collects, seeks sources and contacts of researchers, breeders, and others knowledgeable in the scientific community. Certain species, the most available and well known, are over collected.